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27. The device according to claim 25, further comprising a film of a free electron metal.

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28. The device according to claim 27, wherein the plasma deposited layer is arranged directly on the free electron metal film and further wherein said electron free metal is selected from the group consisting of copper, silver, aluminum and gold.

29. The device according to claim 25, wherein the plasma deposited layer, comprises one or more chemical or biological functional groups.

30. The device according to claim 29, further comprising one or more wet chemically deposited layer(s), arranged on the plasma deposited layer.

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31. The device according to claim 25, wherein the plasma layers comprise one or more compounds selected from the group consisting of amine compounds, sulphur-containing compounds, thiols, sulfides, disulfides and diallyl sulfide.

32. The device according to claim 31, wherein the substrate consists essentially of gold.

33. A process for providing a device for investigating reactions between interactive chemical and biological species, said process comprising the steps of (a) providing a pre-selected substrate, which substrate in turn comprises a film of free electron metal consisting essentially of gold and (b) arranging a layer on the gold film by plasma deposition, which layer comprises sulphur.

34. The process according to claim 33, wherein the plasma layer is directly deposited onto the substrate or onto a metal film arranged on the substrate.

35. The process according to claim 33, wherein plasma is deposited from a monomer/oligomer/polymer in gas form, preferably being a monomer, said monomer being saturated, partially saturated or unsaturated.

36. The process according to claim 33, wherein the substrate is subjected to a pre-cleaning step comprising pre-treating the substrate by means of a plasma etching step before the plasma deposition step.

37. The process according to claim 33, wherein the gas plasma is deposited under the following conditions:

a discharge power of up to 5000 W;

an exposure duration of up to 1000 s;

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a plasma gas flow of up to 10000 cm³/min;
a pressure of up to 1 bar; and
a frequency covering DC, AC, RF, and the MW ranges.

38. The process according to claim 37, wherein the gas plasma is deposited under the following conditions:

a discharge power of up to 500 W;
an exposure duration of up to 100 s;
a plasma gas flow of up to 100 cm³/min;
a pressure between 0.001-50 mbar; and
a frequency between 2-60 Mhz,

wherein the discharge power is pulsed to the plasma, the pulse discharges being separated by up to 100 s.

39. The process according to claim 37, wherein the substrate is treated in an after-glow.

40. The process according to claim 38, wherein following pulse discharge, the substrate is after-treated with a pre-selected gas.

41. The process for providing a device according to claim 33, suitable for investigating reactions between interactive bio/chemical species by means of surface plasmon resonance spectroscopy, said process comprising the steps of:

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10 preselecting a free electron metal substrate, which metal substrate is suitable for allowing investigation by surface plasmon resonance spectroscopy, arranging a pre-selected first functional group species on the free electron metal substrate by means of plasma deposition, which first functional group species protects the free electron metal substrate from a second functional group species whose interaction with the plasma deposited first functional group species can be investigated, thereby preventing undesirable interactions between the free electron metal substrate and the second functional group species, and which first functional group species provides a desired functionality for the second functional group species; and

subsequently arranging a second functional group species on the plasma deposited layer of the first functional group species, whereafter interaction between the first and second functional group species layers, can be investigated by means of surface plasmon resonance spectroscopy.

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42. The process for providing a device according to claim 33, suitable for investigating reactions between interactive bio/chemical species by means of surface plasmon resonance spectroscopy, said process comprising the steps of:

5 preselecting a free electron metal substrate, which metal substrate is suitable for allowing investigation by surface plasmon resonance spectroscopy, arranging a pre-selected first functional group species on the free electron metal substrate by means of plasma deposition, which first functional group species protects the free electron metal substrate from a second functional group species whose interaction with the plasma deposited first functional group

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species can be investigated, thereby preventing undesirable interactions between the free electron metal substrate and the second functional group species, and which first functional group species provides a desired functionality for the second functional group species.

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43. The process according to claim 41, wherein before being exposed to the second functional group species, a bio/chemical functional layer is wet chemically arranged on the plasma deposited first functional group species layer, said wet chemically arranged functional layer being pre-selected for its specificity for the second functional group species and for the prevention of non specific interactions with the said second functional group species.

44. A method for investigating the interaction, of pre-determined chemical or biological species, comprising the steps of analyzing the interaction between the species arranged on a device according to claim 25.

45. A method for investigating the reaction between chemically interactive species, wherein the species are exposed to or deposited on the device of claim 25.

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46. A method for investigating reactions between interactive bio/chemical species, by means of surface plasmon resonances spectroscopy, by the device of claim 25, wherein the device comprises a pre-selected free electron metal substrate, and a pre-selected, plasma deposited layer arranged on the free electron metal substrate, which plasma deposited

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functional group species is chosen for its attachment ability to the free electron metal substrate, and for its specificity to further functional group species, whereby the interaction therebetween is investigatable by means of surface plasmon resonance spectroscopy.

47. The method of claim 46, wherein the pre-selected free electron metal substrate consists essentially of gold, and wherein the plasma deposited layer comprises one or more sulphur compounds.

48. The process according to claim 40, wherein the layer arranged by plasma deposition comprises at least one functional group species, and wherein the gas comprises the at least one functional group species.--

IN THE ABSTRACT:

After the claims, please insert a page containing the Abstract Of The Disclosure, which is attached hereto as a separately typed page.

REMARKS

The specification has been amended to place it into conformance with standard United States Patent practice.

Under date of October 20, 2000, Applicants submitted a substitute sheet containing amended claims 1 and 9 for the above-identified PCT application. Original claims 1-24 and amended claims 1 and 9 have been canceled by this Preliminary Amendment and rewritten as new claims 25-48 to eliminate the multiple dependencies and to bring the claims into conformance with standard United States Patent practice.